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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,234	02/11/2004	Tae-Wook Kim	GK-US045033	9873
22919	7590	10/23/2006	EXAMINER	
GLOBAL IP COUNSELORS, LLP 1233 20TH STREET, NW, SUITE 700 WASHINGTON, DC 20036-2680			LUU, AN T	
			ART UNIT	PAPER NUMBER
			2816	

DATE MAILED: 10/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/775,234

Applicant(s)

KIM ET AL.

Examiner

An T. Luu

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 October 2006.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 6-9 and 14-17 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 6-9 and 14-17 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

An amendment 10-2-06 has been received and entered in the case. Claims 6-9 and 14-17 are pending wherein claims 16-17 are newly added claims. The rejections set forth in the previous Office Action are maintained as indicated below.

#### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 6, 7, 9 and 14-17 are rejected under 35 U.S.C. 102(b) as being anticipate by the Kung reference (U.S. Patent 6,275,110).

Kung discloses in figure 2 a mixing circuit comprising an amplification unit Q5 having an input terminal 28 and an output terminal 29, and amplifying a signal (i.e., at node 27) applied to the input terminal to output the signal to the output terminal; a mixing unit (Q1, Q2) having first, second and third input terminals (i.e., Vi+, Vi- and common node 14 at emitter terminals), and first and second output terminals (i.e., 19, 20), the third input terminal being connected to the output terminal of the amplification unit, the mixing unit mixing signals respectively applied to the first and second input terminals with a signal supplied to the third input terminal, to respectively output the mixed signals to the first and second output terminals (see Background of the Invention); the mixing unit being arranged between a voltage source Vcc+ and the amplification circuit (as shown in figure 3); and a current source 16 for providing a specific quantity of current to the third input terminal of the mixing unit as required by claim 6.

As to claim 7, the amplification unit comprises an amplification element Q5 having a first terminal (base) that forms the input terminal, a second terminal (collector) that forms the output terminal and a third terminal (emitter), wherein the quantity and direction of current flowing from the second terminal to the third terminal are varied on the basis of the level of a voltage applied to the first terminal (i.e., basic operation of transistor); and a degeneration impedance 12 connected between the third terminal of the amplification element and a voltage source  $V_{cc}$ .

As to claim 9, figure 1 discloses the mixer circuit comprising a first amplification element Q1 having a first terminal (i.e., base) that forms the first input terminal, a second terminal (i.e., collector) that forms the first output terminal and a third terminal (i.e., emitter), wherein the quantity and direction of current flowing from the second terminal to the third terminal are varied on the basis of the level of a voltage applied to the first terminal (i.e., basis operation of a transistor); a second amplification element Q2 having a first terminal (base) that forms the second input terminal, a second terminal (collector) that forms the second output terminal, and a third terminal (emitter) connected to the third terminal of the first amplification element to form the third input terminal, wherein the quantity and direction of current flowing from the second terminal to the third terminal are varied on the basis of the level of the voltage applied to the first terminal (i.e., basis operation of a transistor); and figure 2 of Kung would inherently have a load since the circuit of Kung would not work without a load. Consequently, resistors R of fig. 3 would be considered first and second load impedances connected between the second terminals of the first and second amplification elements and a voltage source  $V_{cc}$ , respectively, in order to provide currents  $i_{o+}$  and  $i_{o-}$ .

As to claim 14, the limitation "*wherein the quantity of current being provided to the third input terminal of the mixing unit being equal to the specific quantity of current provided by the current source and a quantity of current provided by the amplification unit*" is seen as a result derived from the configuration of the apparatus.

As to claim 15, fig. 2 of Kung discloses the mixing unit being connected to the amplification unit solely by the third input terminal being connected to the output terminal of the amplification unit.

As to claims 16-17, they are rejected for reciting methods/steps derived from the above apparatus.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 8 are rejected under 35 U.S.C. 103(a) as being obvious over the Kung reference (U.S. Patent 6,275,110) in view of the Fong reference (U.S. Patent 6,147,559).

Kung discloses a mixer circuit comprising all the claimed limitations as required by claim 8 except for teaching a capacitor connected between the first and second terminals of the amplification element as required by the claim.

Fong discloses in figure 1 an amplification element Q1 having a capacitor Cf coupled between the first and second terminals of the amplification element as required by claim 8.

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It would have been obvious to one skilled in the art at the time the invention was made to incorporate the capacitor taught by Fong into Kung's mixer circuit to reduce parasitic capacitance between terminals of a transistor.

A skilled artisan in the art would be motivated to utilize the teaching of Fong for the benefit of improving linearity and noise figure of the electronics circuit (i.e., mixer circuit).

### ***Response to Arguments***

5. Applicant's arguments filed 10-2-06 have been fully considered but they are not persuasive.

Applicant has argued that *transistors Q 1 and Q2, which are identified in the Office Action as the mixing unit, are actually part of an amplifier circuit because it uses only one signal and amplifies it. As seen in Figure 2 of Kung, the input signal applied to the base of Q3 and Q4 is related to the signal applied to the base of Q 1 and Q2 (See column 4, lines 5-10 of Kung).* And concluded that *since only one signal is input, Applicants respectfully assert that no mixing of signals can occur as recited in claim 6 of the present application.* Examiner respectfully disagrees since figure 2 of Kung clearly shows the output of the amplification unit Q5 affecting (i.e., mixing) the signals inputted to input terminals of the mixing circuit Q1, Q2. For instance, if there is no signal inputted at the amplification circuit Q5 (e.g., signal on line 28 is at low level), then Q5 is non-conducting. Consequently, outputs of the mixing circuit are determined solely by current source 16. If there exists a signal inputted at the amplification circuit Q5 (e.g., signal on line 28 is at high level), then Q5 is conducting. Consequently, outputs of the mixing circuit are determined by current source 16 and signal level at collector terminal of Q5. Therefore, signals

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inputted at gate terminals Q1 and Q2 are mixed with signal at input terminal of Q5. As to “*only one signal is input*”, column 4, lines 21-22, indicates  $v_{i+}$  and  $v_{i+}'$  are related. Therefore, they are not the same (i.e., only one) as asserted by Applicant. Lastly, Examiner considers the argument pertaining “*only one signal is input*” is irrelevant since the recitation of claims does not make a distinction of signals providing to an amplification unit and a mixing unit.

### ***Conclusion***

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to An T. Luu whose telephone number is 571-272-1746. The examiner can normally be reached on 7:30-5:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy P. Callahan can be reached on 571-272-1740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

An T. Luu  
10-6-06 *ATL*



TIMOTHY P. CALLAHAN  
SUPERVISORY PATENT EXAMINER  
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